# *Wings on the Wind*

## The Reintroduction of the California condor

### Park Visit Lesson Plans, Grade Level(s): 4-8

**Subject(s):**
**Science**
**English-Language Arts**
**Math**

Standards listed in Appendix A

**Materials:**

Supplied by park: Condor Lab Book, rulers, cord, measuring tape, large open space, dry erase board, writing materials.
Supplied by school: Writing materials (pens or pencils).

**Objectives:**

1. Students will calculate & layout the perimeter of a condor hack (release) site based on scale drawings and figures.
2. Students will be able to recognize that some fluctuations in wildlife populations are natural because ecosystems undergo constant change. As demonstrated by the ensuing discussion.
3. Students will understand the Condor Recovery Program and why Pinnacles National Monument was chosen as a site. This will be demonstrated by the discussion conducted during their walk.

**Overview:**

Classroom learning, even with the assistance of pictures, drawing and other props, will only tell a portion of the story. In this lesson, students will visit Pinnacles National Monument and become immersed in the resources of the park. By the end of this lesson, students will be able to share knowledge, through personal experience, regarding the condor recovery effort. They will calculate and layout the dimensions of a hack (release) site, participate in a simulation of the condors ever-changing environment and determine what makes good or bad habitat, what constitutes a desirable diet and threats that endanger Condor survival. This will all be accomplished while the students are in the California condor's ecosystem.

**Procedure:**
**Activity One: Hack Site Layout**

1 When the students arrive, review the condor hack site and its role in condor recovery while showing them a scale mode.
2 Have the students open their Condor Lab Book to page 7 and measure each side of the hack site, recording their answers next to the drawing. Depending on the grade, have students round to the closest inch or calculate the dimensions in either standard or metric units.
3 Discuss the formula for perimeter. Have students write the formula and calculate the perimeter of the hack site drawing on page 7 (showing all work in the 'Notes:' area on page 6).
4 Explain that this diagram is too small to be an actual hack site and discuss how to use ratios to calculate a more appropriate size. Have students round to the closest unit and use the ratio of 1"=3' or 1cm=.5m to calculate the new dimensions, showing all work.
5 Have students calculate how much string they would need to lay out the perimeter of this new site.
6 Students will now break into teams of four and find an area large enough to lay out their hack site. Each student will have a responsibility:
    a. Keeper of the string
    b. Keeper of the measuring tape.
    c. Group leader
    d. Assistant
7 Teams will now layout the perimeter of the hack site.

If time permits, set up the life-sized weighted condor doll used in the Pre-Visit lesson somewhere near the students "sites."

8 When finished, explain to students that they have laid out the perimeter of a hack site. Have each student walk around, arms outstretched, in their "hack site." Explain that this is the spatial need of a Turkey Vulture.
9 Break students into pairs. As they stand, side by side holding hands, have them outstretch their arms. Performing this exercise inside their "hack site", students will begin to understand the enormous spatial needs of the condor.
10 Have students write observations regarding the size of their hack sites (too large, too small, locational needs, etc.)

*When finished, students will clean up the area and return the supplies.*

**Activity Two: Survival Relay**

1. Review essential components of habitat discussed in the pre-visit: food, water, shelter, range (space), similar species (procreation) and protection from excessive outside influences. This activity emphasizes three of those habitat components - food, water and shelter - but the students should not forget the importance of the animals having a sufficient range in which to live, and that all the components have to be in a suitable arrangement or the animals will die.
2. Have students count off in fours. Mark two parallel lines on the ground ten to twenty yards apart. Have the "ones" line up behind the first line; the rest of the students line up behind the other line.
3. The ones become "condor." Explain that all condor need good habitat in order to survive and that habitat consists of food, water, shelter and range in a suitable arrangement. Explain to students, "For the purposes of this activity, the simulation area is enough space for condor to live. The condors (the ones) need to find food, water and shelter in order to survive. Before the round begins, the condor should decide whether it is looking for food, water or shelter. When a condor is looking for food, it should clamp its hands over its stomach. When it is looking for water, it should put its hands over its mouth. When it is looking for shelter, it should hold its hands together over its head. A condor can choose to look for any one of its needs during each round or segment of the activity; the condor cannot, however, change what it is looking for during the

round; e.g., when it sees what is available, during that round. However, it can change what it is looking for in the next round, if it survives.

4. The twos, threes and fours are food, water and shelter - components of habitat. Each student chooses, at the beginning of each round, which component he or she will be during that round. The students depict which component they are in the same manner listed above for the condor: hands on stomach for food, hands on mouth for water and hands on head for shelter.
5. The activity starts with all players lined up on their respective lines (condor on one side; habitat components on the other side) with their backs to the students at the other line.

Using a flip chart pad or a dry erase board, post the data recorded during the activity. The number of condor at the beginning of the activity and at the end of each round represents the number of condor in a series of years. That is, the beginning of the activity is year one; each round is an additional year.

6. The Ranger begins the first round by asking all of the students to make their signs - each condor deciding what it is looking for, each habitat component deciding what it is. Give the students a few moments to get their hands in place - over stomachs, mouths, or over their heads. As you look at the two lines of students, you will normally see a lot of variety - with some students water, some food, and some shelter. As the activity proceeds, sometimes the students confer with each other and all make the same sign. That's okay, although don't encourage it. For example, all the students in habitat might decide to be shelter. That could represent a drought year with no available food or water.

**NOTE:** If students switching symbols in the middle of a round becomes a problem, you can avoid that by having stacks of three different tokens, or pieces of colored paper, to represent food, water and shelter at both the habitat and condor ends of the field. At the start of each round, players choose one of the symbols before turning around to face the other group.

7 When you can see that the students are ready, count "One . . . two . . . three." At the count of three, each condor and each habitat component turn to face the opposite group, continuing to hold their signs clearly.

8 When a condor sees the habitat component it needs, they are to run to it. Each condor must hold the sign of what it is looking for until getting to the habitat component person with the same sign. Each condor that reaches its necessary habitat component takes the "food," "water," or "shelter" back to the condor side of the line. This is to represent the condor's successfully meeting its needs, and successfully reproducing as a result. Any condor that fails to find its food, water, or shelter dies and becomes part of the habitat. Explain this phenomenon to students. The condor that died becomes a habitat component and therefore becomes available as food, water, or shelter to the remaining condor.

**NOTE:** When more than one condor reaches a habitat component, the student who gets there first survives. Habitat components stay in place on their line until a condor needs them. If no condor needs a particular habitat component during a round, the habitat component just stays where it is in the habitat. The habitat person can, however, change which component it is from round to round.

9 The Ranger (or a designated recorder) will keep track of how many condor there are at the beginning of the activity (start), and at the end of each round (week 1, 2, 3…). Continue the activity for approximately ten rounds. Keep the pace brisk and the students will thoroughly enjoy it.

10 After the students have played five rounds, introduce a major threat (lead poisoning, rat poisoning, water pollution, power lines, habitat loss) into the simulation. Randomly assign two or three habitat component students a threat. For example, if a student were to choose food, tell

them that they have lead poisoning and if chosen that condor dies and both students stay on the habitat side.

11 For the final round, whatever the students choose, all condors die. The purpose of this is to help students understand what extinct really is. Though we hope this never happens to the California condor.

12 At the end of the exercise, gather the students together to discuss the activity. Encourage them to talk about what they experienced and saw. For example, in the beginning they saw a small group of condor (seven students in a class size of 28) finding more than enough of its habitat needs. The population of condor expanded over two to three rounds of the activity until the habitat was depleted and there was not sufficient food, water and shelter for all the members of the group. At that point, condor starved or died of thirst or lack of shelter, and they returned as part of the habitat. Such things also happen in nature.

**NOTE:** In real life, populations might also experience higher infant mortality and lower reproductive rates.

13 Have students copy and graph the condor data onto the chart and graph included in their Lab Book on page 5. The students will see this visual reminder of what they experienced during the activity: the condor population fluctuated over a period of years. This is a natural process as long as the factors which limit the population do not become excessive, to the point where the animals cannot successfully reproduce. The wildlife populations will tend to peak, decline, and rebuild, peak, decline, and rebuild - as long as there is good habitat and sufficient numbers of animals to successfully reproduce.

14 Ask the students to summarize some of the things they have learned from this activity. What do animals need to survive? What are some of the "limiting factors" that affect their survival? Are wildlife populations static or do they tend to fluctuate as part of an overall "balance of nature?" Is nature ever really in "balance" or are ecological systems involved in a process of constant change?

**Activity Three: Exploring Condor Habitat**

The Ranger will lead the class on a walk discussing the park's biodiversity. As they proceed, the ranger will periodically question students about their surroundings in regard to condor habitat, food sources, nesting and potential threats. They will discuss what makes each area suitable habitat, what could make it better and what changes might threaten the condor's survival. Students will be asked to write observances (text and/or pictorial) in their Condor Lab Book.

**NOTE:** Condor Lab Books should be collected by the teachers at the end of the Park visit for their and the Ranger's review. They will be returned to the students as quickly as possible so they may use them as reference material and for the Post-Visit activities.

## Assessment:

Evaluation of the students' Condor Lab Book. Evaluations should include: the notes and pictures depicting what makes quality condor habitat, what could make it better habitat, and what natural changes or human intervention could reduce its quality.